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Is short term debt maturity linked to real earning management?

1. Introduction

The literature on the effect on earnings management of short term debt maturity remains rather inconclusive. In addition, many studies have concentrated on the debt covenant hypothesis on the basis of the optimistic accounting principle and documented that short-term debt maturity helps firms to curb earnings management behavior (DeFond & Jiambalvo, 1994; Fields et al., 2018; Gupta et al., 2008). These studies primarily utilize the proxy of accruals-based earnings management (AEM) and focus only on a linear relationship between short-term debt maturity and the management of earnings.

Fields et al. (2018) argue that refinancing pressure can be conducive to managerial misconduct as a borrower, especially when they employ a substantial volume of short-term debt. Fung and Goodwin (2013) argue that the theory of financial distress predicts a positive correlation between debt and earnings management. Fields et al. (2018) show that firms with increased short-

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term debt maturity are more likely to engage in accruals-based earnings management, because the refinancing pressure caused by short-term debt employment incentivizes firms to manipulate earnings to make them look more appealing. Thanks to this, refinancing can take place, enabling firms to continue their operations.

On the other hand, a number of research papers on bank monitoring have documented either a negative effect (Ahn & Choi, 2009) or mixed results (Fung & Goodwin, 2013). Short-term debt maturity, according to Fung and Goodwin (2013), may play a role as a governing mechanism that curbs incentives for earnings management. Although the results are somewhat inconsistent, firms are commonly considered to be more likely to manipulate earnings where there is a higher degree of information asymmetry and a lower level of monitoring (Ahn & Choi, 2009; Jones et al., 2005).

One clear limitation of previous literature is that, as noted, empirical research appears to concentrate on accrual-based earnings manipulation (see, for example, DeFond & Jiambalvo, 1994; Hosseini & Joshaghani, 2019; Tang & Wati, 2021), whereas there are two basic forms of earnings management. Management of real earnings may be either a substitution or a complement to the accrual-based variant. Studies on the relationship between debt, especially short-term debt maturity, and real earnings manipulation are relatively rare, although the connection may have a clear theoretical context. In addition, by exploring a non-linear relationship between these two variables, we seek to resolve the mixed results on the effect of debt on earnings management.

A panel dataset of firms listed in Vietnam for the period 2009-2017 is used to analyze the effect of short-term debt maturity on earnings management. In this paper, we primarily focus on firms operating in this market, firstly because Vietnam is an emerging economy where bank credit still dominates as a major source of corporate financing. To improve borrowing capacity and have better access to debt funding, firms could be inclined to participate in earnings management actions (García-Teruel et al., 2014). Another ex-post motive is to prevent breaches of the debt covenant (DeFond & Jiambalvo, 1994). Those motivations appear pressing especially in the case of short-term debt maturity because firms may face more intense liquidity risk (Diamond, 1991). Furthermore, inadequate market and weak institutions in Vietnam may exacerbate firms' access to long-term capital, forcing firms to employ excessive short-term debt maturity. In this context, short-term debt maturity may be destructive might lead to undesirable consequences and warrants a thorough study in an emerging country's setting.

The remainder of the existing paper is arranged as follows. A brief review of the literature on the types of earnings management, the motivation for earnings management, especially debt-related factors, and real earnings management is given in section 2. The research approach, outlining the hypotheses, data handling and techniques for estimation, are discussed in section 3. The findings are presented in section 4, while section 5 concludes the paper with many implications for related stakeholders.

2. Literature review

The method of manipulating numbers to confuse financial statement users with regard to the actual economic performance of firms is earnings management. Such a behavior is often opportunistic in a sense that it may influence contracting which depends on the earnings numbers reported on financial statements (Healy & Wahlen, 1999). To execute earnings management, there are two widely cited techniques: accruals-based earnings management (AEM) and manipulation of actual operations (REM). Previous research indicates that the debates on earnings management revolved mainly around accruals-based earnings management (Ruiz, 2016).

The connection between short-term debt maturity and earnings management exists as a result of information asymmetry between banks, as a party that provides financing, and firms. Banks approve loans based on firms' financial statements; therefore, to obtain new loans perhaps one way for firms is through manipulating earnings in a bid to alter the bottom line (Gupta & Fields, 2006) (i.e., borrower's moral hazard problem). After loans are granted, moral hazard arises in a principal-agent relationship. To prevent this opportunistic behavior of borrowers, banks conduct monitoring activities. Both Diamond (2004) and Rey and Stiglitz (1993) praise short-term debt maturity and explain why short-term debt maturity contracts can give banks/investors greater monitoring advantage: bad news in the presence of short-term debt maturity is easier to be revealed and lenders could demand payment immediately (Diamond, 1991).

Instead, on the other side, the debt covenant hypothesis offers another view on the effect on earnings management of short-term debt maturity. The reasons for earnings manipulation in the presence of short-term debt maturity are because borrowers want to (i) avoid the violation of loan covenants (DeFond & Jiambalvo, 1994); (ii) delay the acknowledgment of negative news (Gupta et al., 2008); (iii) obtain a new loan under refinancing pressure (Fields et al., 2018).

By incorporating non-linear models, Trung et al. (2020) have reconciled the mixed results between short-term debt maturity and accrual-based earnings manipulation, arguing that short-term debt maturity decreases (increases) the probability of earnings management at low (high) levels.

Compared to long-term debt maturity, one unique distinctive characteristic of short-term debt maturity is that short-term debt maturity holds firms more accountable and subject to more constant debt holder monitoring, allowing them to function as an efficient governing mechanism (Trung et al., 2020). Since firms are in need of engaging in information exchanges with lenders, short-term debt maturity could effectively discipline borrowing firms if they choose to shirk (Myers, 1977). Another difference between the two forms of debt is that short-term debt maturity is more prone to make businesses susceptible to financial distress (Gupta et al., 2008). This is because the maturity of short-term debt greatly raises the liquidity risk, compared to the long-term one (Trung et al., 2020).

In summary, the above discussion highlights possible different impacts of short-term and long-term debt, along with the inconclusive empirical evidence on the association between debt and earnings management. Research should be undertaken to investigate the effect of short-term debt maturity. Furthermore, prior studies are more into the effect of debt on earnings management based on accruals (DeFond & Jiambalvo, 1994; Ghosh & Moon, 2010; Prabowo et al., 2020), leaving the gap of how short-term debt maturity effects real earnings management under-explored.

Our study provides a many-fold contribution to the literature. First, neither of these studies examines the non-linear connection between short-term debt maturity and earnings manipulation. Since short-term debt has different features compared to long-term one, analyzing just the total debt (DeFond & Jiambalvo, 1994; Ahn & Choi, 2009; Ghosh & Moon, 2010; Prabowo et al., 2020) is not adequate. Therefore, we gather and draw on relevant theories and empirical studies to introduce non-linear models to fill this gap. Second, our analysis employs real activities manipulation as recommended by Kim et al. (2011), rather than accruals-based management which has been extensively explored. Real activities manipulation is preferred to the accrual-based method because it is simpler to execute and more challenging for outsiders to uncover (García-Teruel et al., 2014; Kim et al., 2011; Zang, 2012), thus ignoring the latter technique may lead to a biased conclusion on the effect of debt on the management of earnings. Finally, our study focuses on

Vietnam – an emerging market – where the earnings management activity of a company is highly influenced by firm-bank relationships. There is one study that analyzes the relationship between debt maturity and real earnings management, but the research context is the US (see Draief & Chouaya, 2022), an economy with much different institutional setting and development level of financial markets.

Vietnam is an interesting setting for the study of the mentioned link since even listed firms tend to depend heavily on the maturity of short-term debt, in spite of collective efforts to improve access to long-term financing from the government and international entities. Vietnam was awarded the rank of 29th out of 190 territories with respect to credit access for firms, even with the revamped regulations on collateral requirements and the operations of credit information sharing (Trung et al., 2020). Therefore, research in this setting can provide more insights and have crucial implications.

3. Research methodology

3.1. Hypothesis development

Managers conduct earnings management behavior for many purposes, one of which is to obtain loan contracts with better terms. In general, managers are motivated to manipulate earnings because banks usually base on the financial statements to approve the loans. For firms with short-term debt maturity, the incentive is greater as short debt maturity requires renewals more often. Nonetheless, this type of debt may preferably play a monitoring role on the firms (Diamond, 2004; Rey & Stiglitz, 1993), in particular, where short term debt is still low. We argue that short-term debt maturity has a commendable impact at a low degree of short-term debt, minimizing earnings management. Or at least, at low short-term leverage, short-term debt maturity causes less earnings management compared to high short-term leverage. Short-term debt maturity, on the contrary, could strongly encourage borrowers to manage earnings at high short-term debt maturity levels. This is because it can exacerbate the threats of liquidity risk and bankruptcy (Gupta et al., 2008).

In summary, our central empirical hypothesis is:

H1: There is a U-shaped relationship between short-term debt and real earnings management.

3.2. Data collection

For the years 2009-2017, we filter firms from the Thomson Reuter database using the following parameters: (1) the firm is listed on the two largest exchanges of HOSE and HNX in Vietnam, (2) the firms are selected from nine GICS sectors (excluding Financials sector), (3) only leveraged firms are included since we intend to investigate the effect of (short-term) debt on the earnings management behavior. The final sample totals 601 firms and 3,936 firm-year observations. We divide the sample into four equal groups according to the short-term debt maturity quantiles. STDQ1 means the first quartile, STDQ2 second quartile, STDQ3 third and STDQ4 the highest fourth quartile, respectively.

Following Roychowdhury (2006), using estimates of the abnormal production costs, abnormal discretionary expenses, and an overall index that incorporates all components, we construct proxies for real earnings management. Following Fung and Goodwin (2013), as a metric for short-term debt maturity, we use the ratio of short-term debt to total assets. We presume that the liquidity concerns arising from the failure to renew debt due in the very near future are due. Therefore, we describe short term debt maturity as debt maturing in a year or less, similar to Gupta and Fields (2006).

Table 1. Summary statistics (n=3,936)

STD Quartiles	STD	REM1	REM2	REM3
	Mean	Mean	Mean	Mean
STDQ1 (Lowest quartile)	0.0077	-0.0370	-0.0114	-0.0484
STDQ2	0.0720	-0.0064	-0.0026	-0.0090
STDQ3	0.1843	0.0124	0.0017	0.0141
STDQ4 (Highest quartile)	0.3799	0.0497	0.0226	0.0722

Source: calculation by the author from analysis data

Statistics on short-term debt maturity and earnings management in each quartile are listed in table 1. These figures clearly demonstrate that with rising short-term debt maturity levels, real earnings management increases. This trend is consistent in both three measurements of real earnings management, namely

REM1, REM2, and REM3. Interestingly, in first and second quartiles (low-short term debt maturity level), it appears that real earnings management responds negatively to short term debt maturity, in favor of the lenders' monitoring hypothesis. On the other hand, its positive response at higher quartiles supports the debt covenant hypothesis. This might imply a non-monotonic relationship. In the following section, we explore the relation between short-term debt maturity and earnings management through empirical methods to address this problem.

3.3 The baseline model

In this article, we use the following model, in line with Gupta and Fields (2006) and Fung and Goodwin (2013):

$$EM_{it} = \beta_0 + \beta_1 STDQ2_{it} + \beta_2 STDQ3_{it} + \beta_3 STDQ4_{it} + Controls_{it} + \varepsilon_{it} \quad (1)$$

Where: EM is the dependent variable, earnings management, using three proxies including firm's abnormal production costs (REM1), abnormal discretionary expenses (REM2), and an overall measure that incorporates all parts of the components respectively (REM3). STD: independent variable, short term debt, short-term debt / total assets assessed. STDQ1, STDQ2, STDQ3, and STDQ4 are four quartiles of short term debt maturity, and STDQ1 is omitted to avoid perfect multicollinearity. Control variables are drawn on the relevant literature and discussed in section 5 (also see Appendix). ε_{it} is the residual of the model.

As for the estimation strategies, we rely on the fixed effects model which enables the handling of fixed effects, one potential source of endogeneity. Fixed effects modeling is typically employed when panel datasets are employed. We also conduct System Generalized Method of Moments to deal with other sources of endogeneity, such as the two-way correlation between the dependent variable and independent ones. The latter method serves as a robustness check to ensure the reliability of our findings. Conventional tests of the autocorrelation of order 2 and overidentification are conducted to ensure that the instruments are valid (Roodman, 2009). All the p-values of test results are higher than 10 percent, satisfying the conditions of no autocorrelation of order two and overidentification, suggesting that our estimates are reliable for statistical inferences.

4. Empirical results

4.1. Regression analysis

The regression results are shown in table 2. REM1, REM2, and REM3 present the three proxies, including the firm's abnormal production costs (REM1), abnormal discretionary expenses (REM2), and the overall measure that incorporates all parts of the components respectively (REM3).

Table 2. Regressions using fixed effects (n=3,936)

Variables	REM1	REM2	REM3
	Model 1	Model 2	Model 3
STDQ2	0.016	0.004	0.019
STDQ3	0.023*	0.008	0.031**
STDQ4	0.029*	0.012*	0.042**
Costofdebt	-0.003**	0.001	-0.002**
Effectivetax	0.006**	0.002**	0.009**
Zscore	-0.049***	-0.004	-0.053***
Postprofit	0.032**	0.013*	0.046**
Marketshare	0.280**	0.145*	0.426*
ROA	-0.412***	-0.059**	-0.470***
TA	-0.000*	-0.000**	-0.000**
MTB	0.004	-0.003	0.000
_cons	0.032	-0.006	0.026

Note: *, **, and *** at 10 %, 5%, and 1% respectively signify significance. STDQ1 is omitted because of perfect multicollinearity.

Source: calculation by the author from analysis data

From table 2, the coefficients of the independent variables in higher quartiles are completely in line with our expectation: both value and significance of coefficients of STDQ2 to STDQ4 increase with the increasing of quantiles of short-

term debt maturity. This implies that managers have incentives to manipulate real activities at high short-term debt levels.

Interestingly, at the second quartile of short term debt maturity, the coefficients of all three proxy of earnings management are insignificant, suggesting that managers are unlikely to manipulate real activities in low short term debt maturity rate. Because managers seem not to be so concerned about liquidity risk when facing low levels of short term debt maturity. Therefore, debt covenant violation is a weak motivation for managers' opportunistic behavior in a low degree of the short-term maturity of debt. Another potential reason may be that less information asymmetry is correlated with those borrowing less short-term debt maturity, so the monitoring of banks plays a minor role in their strategy for earnings management. Therefore, at low levels of short-term debt, the behavior of firms is more in line with the monitoring hypothesis of short-term debt (Myers, 1977).

Besides that, the influence of debt in short-term maturity on earnings management is documented with all the three proxies of real activities manipulation include REM1, REM2, and REM3. Also, the effect is larger when using REM1 to proxy for real earnings management than REM2. This indicates that managers are more likely to temporarily raise revenue, lower costs of products sold, and ultimately cut discretionary spending to achieve short-run earnings goals in the presence of high levels of short-term debt. The result is consistent with financial distress hypothesis at high levels of short-term debt (Fung and Goodwin, 2013).

To summarize, the results are not completely in line with hypothesis H1 which points to a U-shaped relationship between short-term debt and earnings management, since the coefficient of STQ2 is not significantly negative. However, the results show supporting evidence that firms tend to refrain from engaging in real earnings management at low levels, and only increase earnings management at higher levels of short-term debt maturity, leading to a nonlinear relationship between short-term debt and real earnings manipulation. This serves as an indicator that firms can weigh up the costs and benefits associated with real earnings management. The result is also consistent with Draief & Chouaya (2022), which documents a positive relationship between real earnings manipulation and short-term debt maturity for U.S firms.

One concern is whether the outcomes are driven by any other factors is not certain. We reply to this concern by including some control variables in our model as follows:

First, after Ghosh and Moon (2010), we add *Costofdebt* to find a significant association at low and high debt levels between interest expense and earnings

quality. We also use the Z-score to track the risk of bankruptcy that could occur in the presence of short-term debt maturity (Diamond, 2004).

Secondly, since businesses with greater market shares participate in higher levels of exploitation of actual activities, we use *Marketshare* (Zang, 2012). *Effectivetax* is also included because tax expenditure, creating an incentive to reach benefit goals (Cook et al., 2008; Dhaliwal et al., 2004).

Finally, we also have some control variables in our regression that are significantly linked to earnings management, such as *Postprofit*, *ROA*, *TA* and *MTB*. Because firms with a strong financial health are unlikely to manage earnings upwards (Gupta & Fields, 2006; Gupta et al., 2008). The effects of these control variables are in line with previous research findings and our expectations. *Costofdebt*, *Z-Score*, *Postprofit*, *ROA*, and *TA* coefficient figures are all negative and important, indicating that real earnings management for firms with more financial difficulty is higher. On the contrary, the coefficient estimates of *Effectivetax* and *Marketshare* are positive and important, suggesting that firms with advantages in the industry have more flexibility for real activities manipulation.

4.2. Robustness test

It is possible that there might be an endogeneity issue arising from the reciprocal relationship between the dependent variable and short term debt maturity variable (Gupta et al., 2008) as well as other explanatory variables. To address this issue, we apply the two-step system GMM (Roodman, 2009). All the p-values of test results are higher than 10 percent (not reported in table 4 for sake of brevity), satisfying the conditions of no autocorrelation of order two and overidentification, suggesting that our estimates are reliable for statistical inferences. Table 3 indicates that findings are largely consistent with previous results in table 2, i.e., businesses are more likely to exploit real earnings at high short-term debt maturity levels.

Table 3. Regressions using SGMM (n=3,936)

Variables	REM1	REM2	REM3
	Model 1	Model 2	Model 3
STDQ2	0.051**	-0.013	0.081**
STDQ3	0.054**	-0.011	0.086**

STDQ4	0.091**	0.009	0.148***
Costofdebt	-0.017**	-0.002	-0.018
Effectivetax	0.048*	-0.020*	0.054*
Zscore	-0.048**	-0.010	-0.066**
Postprofit	0.064	0.034*	0.140**
Marketshare	-0.019	-0.328	-0.442
ROA	-0.114	-0.020	-0.205
TA	-0.000	0.000	0.000
MTB	-0.025**	-0.016**	-0.033**
_cons	-0.030	0.012	-0.095

Note: *, **, and *** at 10 %, 5%, and 1% respectively signify significance. STD2Q1 is omitted because of high multi-collinearity.

Source: calculation by the author from analysis data

5. Conclusions

This paper explores the effect on real earnings management of short-term debt maturity for non-financial listed companies in Vietnam from 2009-2017. By exploring the non-linearity relationship between short-term debt maturity and real earnings management, our research expands the literature. Firstly, our findings show that managers are unlikely to manipulate their earnings at low levels of short term debt maturity due to lower liquidity risk. The higher short-term debt maturity levels, however, are the greater incentive for managers to manipulate earnings. This means that the opportunistic activity of managers increases with rising short-term debt maturity levels. Finally, managers are encouraged to manipulate revenue, overproduce inventory to lower the cost of products sold and reduce discretionary spending to reach short-run earnings goals in the presence of high levels of short-term debt maturity. These findings complement to the understanding of the impact of debt, including both total debt in general and short term debt maturity in particular, on earnings management.

There are two highlighted implications from this study. The first is that accounting numbers will faithfully reflect the underlying potential economic

output for businesses with low short-term debt maturity, because managers might not be so worried about liquidity and reduce the incentives to manipulate earnings, supporting the short-term debt maturity monitoring hypothesis. The second is that managers prefer to manage earnings by the modification of real operations, validating the debt covenant theory, with extreme levels of short-term debt maturity. Therefore, for firms with high levels of short-term debt, investors/lenders should be careful in using financial statements as the sole source of information to analyze firm's actual financial performance.

We assume that comparing the effect of short term debt maturity on both real and accrual-based earnings management will be more useful. This will help to provide a thorough evaluation of the trade-off or supplementary relationship between the two forms of management of earnings at various stages of the short-term maturity of the debt.

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Summary

Is short term debt maturity linked to real earning management?

This paper explores the association between the maturity of short-term debt and real earnings management in the context of an emerging market. We use a panel dataset of listed firms in Vietnam over the period from 2009 to 2017 and employ conventional methods for panel data analysis. Our work contributes by documenting a non-linear relationship between short-term debt maturity and manipulation of earnings. In particular, businesses prefer to refrain from manipulating earnings at low short-term debt maturity levels but are likely to manage them at higher short-term debt maturity levels. Under a battery of robustness evaluations, this result remains unchanged. This means that investors/lenders of firms should be vigilant with the information recorded on financial statements because managers can manage corporate earnings, especially at high short-term debt levels.

Keywords: *Real earnings management; short term debt maturity; information asymmetry.*

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Appendix

Control variables	
Costofdebt	Measured by the ratio of interest expense to average total debt, this reflects the expense of debt financing.
Effectivetax	Determined by the ratio of the accumulated income taxes to the accumulated pre-tax income, this reflects effective tax rate.
Zscore	Reflects the financial health of the company, calculated by the Z-score of Altman.
Postprofit	It is a dummy variable, equivalent to 1 if the company reports a profit in the fiscal year and 0 if the company reports a profit in the fiscal year..

Marketshare	This is the opposite of the costs associated with the manipulation of real operations, measured by the ratio of a company's revenue to the industry's overall sales.
ROA	Measured by the ratio of operating income to total assets, this reflects the output of the companies.
TA	Represents the size of the businesses, determined by the total assets' logarithmic.
MTB	Measured by the ratio of the market value of equity to the book value of equity, or market-to-book, it reflects growth opportunities.